

Comments on the June 2017 Phase III Remedial Action Plan – USACE NAE 08AUG2017

1. Mass flux: Section 2.4.4.1: Mass flux is calculated for the plume width where TCE exceed the GW-3 standard of 5,000 ug/L. It is assumed that this value was used because of the GW-3 standard, but the exposure criterion is not relevant in calculating the overall mass flux. It would more appropriate to select a MUCH lower concentration contour of TCE for use in estimating mass flux. The only reason to select a contour at all for a flux estimation (rather than extending the width to the non-detect boundary) is the argument that a large area discharging at a low concentration (e.g., 5 ug/L) will not significantly change the overall calculated mass flux. With the plume width set at the 5,000 ug/L contour, the cross-sectional area where concentrations are still in the thousands of ug/L could be significant, resulting in a significant underestimation of mass flux. Selecting the 100 ug/L contour to bound the plume width is considered a conservative, reasonable assumption.
2. ZVI PRB: ZVI lab testing was performed using groundwater from MW-15D, a well that has historically had high concentrations of PCBs and CVOs as well as observed DNAPL. From a contaminant standpoint, it was logical to use this location for testing. A USACE comment on the 2016 Phase III recommended doing the kind of bench-scale testing that B&C contracted SiREM to perform. However, one of the concerns that was expressed in that comment was to evaluate the effect of the site groundwater to determine whether the site groundwater would result in passivation or clogging of the ZVI and degradation of the efficacy of the iron. Given the depth of well MW-15D, it does not appear to be representative of the shallow groundwater influenced by tidal estuary waters the PRB would be in contact with. Specific conductivity for MW-15D was between 3 and 4 mS/cm in samples collected in 2014 and 2015; sulfate concentrations were approximately 170 mg/L; and chloride concentrations were approximately 1,100 mg/L. Shallower samples closer to the harbor bottom tended to have higher specific conductivity, ranging to greater than 30 mS/cm during the same 2014-15 sampling events, with these elevated values assumed due to the influence of more saline estuary waters (values for sea water are: conductivity ~5,000 mS/cm; sulfate concentration ~2,500 to 3,000 mg/L; and chloride concentration ~19,000 mg/L. Did SiREM consider the impact of high total dissolved solids from the sea water-groundwater mixture that would be expected to flow through the PRB during the hydraulic gradient reversal that has been documented to occur at the higher stages of the tidal cycle? Other PRBs installed in high total dissolved solids environments have experienced heightened solids precipitation within the barrier, affecting their effectiveness/longevity. This issue does not appear to have been considered in the bench test or assessment of PRB alternatives.
3. A PRB is a key element of the selected remedies. However, in addition to the issues discussed above, as described in the USACE comments on the 2016 Phase III, a PRB is designed to treat dissolved phase contamination and will not treat DNAPL that may move through it. As noted in comment 6 below, the revised Phase III indicates that a shoreline PRB would be installed directly through probable DNAPL zones where there is a defined potential for short-distance DNAPL migration.
4. For the 2016 Phase III, the USACE provided comments about the assumptions of efficacy of installing a PRB along the bedrock surface using one-pass trenching. This is not likely to be effective for a

bedrock with significant topography, and therefore there is likely to be a section of the overburden above the bedrock without ZVI.

5. The selected remedies for the site are centered around on-site consolidation of the most contaminated soil and capping. In addition, the Phase III indicates that all remedies with AULs were rejected due to concerns of the property owners. But it is not clear how the an on-site “cell” or “landfill” can be constructed and maintained as secure without institutional controls (or AULs). It would appear that future building or construction of any sort has the potential for causing future releases or exposures.
6. DNAPL Summary (Section 2.4.7 and Appendix D): In response to comments on the 2016 Phase III, a detailed DNAPL evaluation of the site was completed for the revision. Figures 2 and 3 of Appendix D show “probable” DNAPL zones extending along approximately 40% of the Aerovox shoreline, immediately adjacent to the harbor, for the shallow and deep overburden zones of the aquifer, with the following statements provided in the supporting text (**bolding of text** has been added for emphasis):

“Therefore, the DNAPL mobility evaluation is congruent with the investigative findings and supportive of a **middle-** to late-stage DNAPL plume condition” (Appendix D, page 21)

“Current site conditions indicate that contiguous DNAPL bodies of sufficient lateral extent to migrate under these gradient influences are not **likely** present at the Site and the **major** if the DNAPL present today is in the form of residual DNAPL.” [assumed text is “...major form of DNAPL...”] (Appendix D, page 21)

“Rather, the DNAPL is considered to be stable, but may have micro-scale mobility, defined by the MCP as NAPL with a footprint that is not expanding, but which is visibly present in the subsurface in sufficient quantities **to migrate or potentially migrate as a separate phase over a short distance and visibly impact an excavation**, boring or monitoring well.” (section 2.4.7, page 2-23)

DNAPL guidance documents define the “middle” stage condition as still having some pooled DNAPL in the subsurface. Although it is agreed that the major form of DNAPL at the site is likely residual at this time, even a small amount pooled DNAPL along the boundary of the site presents a significant risk of recontamination of harbor sediments. Just as DNAPL was able to migrate the “short distance” into monitoring well MW-15D and into the shoreline excavations performed in 2016, some release into the harbor is expected as sediments adjacent to the Aerovox site are excavated. With a remediation criteria of 10 mg/kg for the sediments of the upper harbor, release of even a small amount of DNAPL has the potential to recontaminate large areas of the harbor.

